

In The Claims:

3. Transfection vector according to Claim 1 or Claim 2, [characterized in that] wherein the polymeric sequence of the basic amino acids comprises between 10 and 50 amino acid residues, selected from the group consisting of lysine, arginine and ornithine.

4. Transfection vector according to [any one of Claims 1 to 3, characterized in that] claim 1 or 2, wherein the cationic polymeric sequence is selected from the group consisting of polymeric amines.

5. Transfection vector according to [any one of Claims 1 to 4, characterized in that] claim 1 or 2, wherein the NLS sequence is at the N-terminal end of the transfecting peptide and the polymeric sequence of basic amino acids is at the C-terminal end of the said transfecting peptide.

6. Transfection vector according to [any one of Claims 1 to 5, characterized in that] claims 1 or 2, wherein, when the chemical substance is a nucleic acid, the transfecting peptide/nucleic acid ratio is between 0.3:1 and 15:1, preferably between 2:1 and 6:1 [, preferably between 4:1 and 6:1].

7. Transfection vector according to [any one of Claims 1 to 6, characterized in that it is] claims 1 or 2, combined with a targeting ligand.

8. [Composition, characterized in that it essentially consists] A composition consisting essentially of a transfection vector according to [any one of Claims 1 to 7] claim 1 or 2 and a suitable vehicle selected from the group consisting of bile salts, antiproteases, cyclodextrins and derivatives thereof, antiseptics and polyols [, for use as a medicament].

9. [Method] A method of transfecting eukaryotic cells *in vitro* with a chemical substance selected from the group consisting of nucleic acid sequences, proteins, peptides and

*d* pharmacologically active chemical substances, characterized in that it comprises the bringing into contact and the incubation of a transfection vector according to [any one of Claims 1 to 8,] claim 1 or 2 in a dilution buffer comprising 100 – 150 mM NaCl with eukaryotic cells for 15 to 120 minutes at room temperature, the chemical substance to be transfected:transfecting peptide ratio being between 0.3:1 and 15:1, preferably between 2:1 and 6:1, preferably between 4:1 and 6:1.

10. Peptide vector for transfecting a chemical substance selected from the group consisting of nucleic acid sequences, proteins, peptides and pharmacologically active chemical substances, [characterized in that it contains,] containing, in addition to the said chemical substance, at least one transfecting peptide which comprises:

- a segment of an NLS sequence consisting of sequence ID NO:2,
- a segment of a sequence consisting of sequence ID NO:10,
- a segment of a sequence consisting of sequence ID NO:16, and
- a polylysine [, for use as a medicament].